DURBAN UNIVERSITY OF TECHNOLOGY
FACULTY OF ACCOUNTING AND INFORMATICS
BINCT – ADCTI
PBDV301 – PBDE401

EYETECH'S TUTORHIVE

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WEB – BASED PROJECT

PROJECT IDEA: EDUCATION

A. INTRODUCTION

Project overview

- This project is developed for education purpose and designed to capture, store student's details that are seeking teaching assistance and tutor positions in relevant faculties.
- This web-based application will help in the means of selection procedure for the admin where they can shortlist students that seek positions and students can schedule appointments.

Purpose

- The main purpose of the project is to provide users and administration that are seeking or wish to apply for positions such as development of teaching skills (seeking assistance teaching) and tutoring positions with a user friendly, convenience working application.
- This will help both undergraduate and graduate students to easily send in their required documents or filling in their details for certain positions, and for scheduling appointments in relevant faculties on the proposed web application.

Scope

- the main aim for the proposed solution (web-based application) is to develop a system that is like job portal where users (students) can book for appointments and be shortlisted, the administration can post available positions and students can register on the application and be able to access the position by means of applying.
- User will be able to capture their details and as well as submitting the required documents on the application.

Problem the application is trying to solve.

- The students both undergraduate and graduate that are seeking teaching assistance and tutor positions offered by the academic departments needs an accessible solution by the means of a web-based application for students provide their details, submit the documents for the purpose of shortlisting candidates that are suitable for available positions offered by academic departments, where application's users can easily schedule appointments in the working web-based application.
- The application will make it easy for applicants (students) to be shortlisted and be able to schedule appointments.
- Where users (students) will have to register in the application for them to be able to submit required documents.

The importance of the proposed solution

- the web-based application will give the users the best user experience by allowing them to access the application via their favorite mobile devices or

through their personal computers, unlike regular queuing up in real-life scenario.

- this will allow users to apply at their own comfort where they have to register in the application and fill in their required details, also submitting the document in just few minutes to maximize their chances of being shortlisted for the position they are applying for or even for scheduling the appointment wherever they are.
- This will help by not causing any inconvenience to the students who wish to apply instead it will give users an easy way to apply for positions proposed by the academic departments.
- According to: *"Online admission system: advantages & disadvantages by Sujatha, December 31,2015*: Those who have seen university officials accepting thousands of paper applications each day at office counters understand that high fatigue and monotony involved in the paperwork is a catalyst for errors, the application can help eliminate such factors.
- The online admission system is highly reliable and efficient and eliminates chances of such errors.

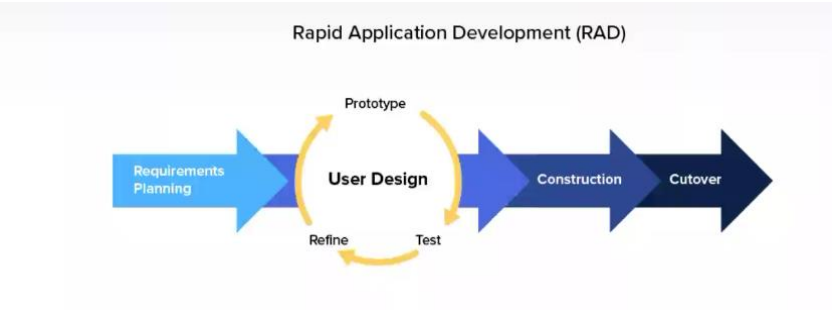
B. SOFTWARE DEVELOPMENT PROCESS MODEL

The methodology we used for the software/application was RAD (Rapid Application Development). We used this processing model due to having less time to create a foolproof plan to go about creating this application.

We started off with a basic flask file and used html and python to complete the code for the program. The refinement of the program was done by using CSS which made the application user – friendly.

A highly skilled set of programmers was needed to create the application using the various software and technologies therefore we divided the group into 2 parts: programmers and documenters. Throughout the time period of creating the application, we had extreme changes and decisions to make in a short amount of time. This led to us having many prototypes of our application.

The focus was to create and develop the application and code instead of planning. Throughout the testing process the group had learnt more and improved on the features of the application.



C. ARCHITECTURE

HIGH-LEVEL OVERVIEW OF THE WEB APPLICATION ARCHITECTURE

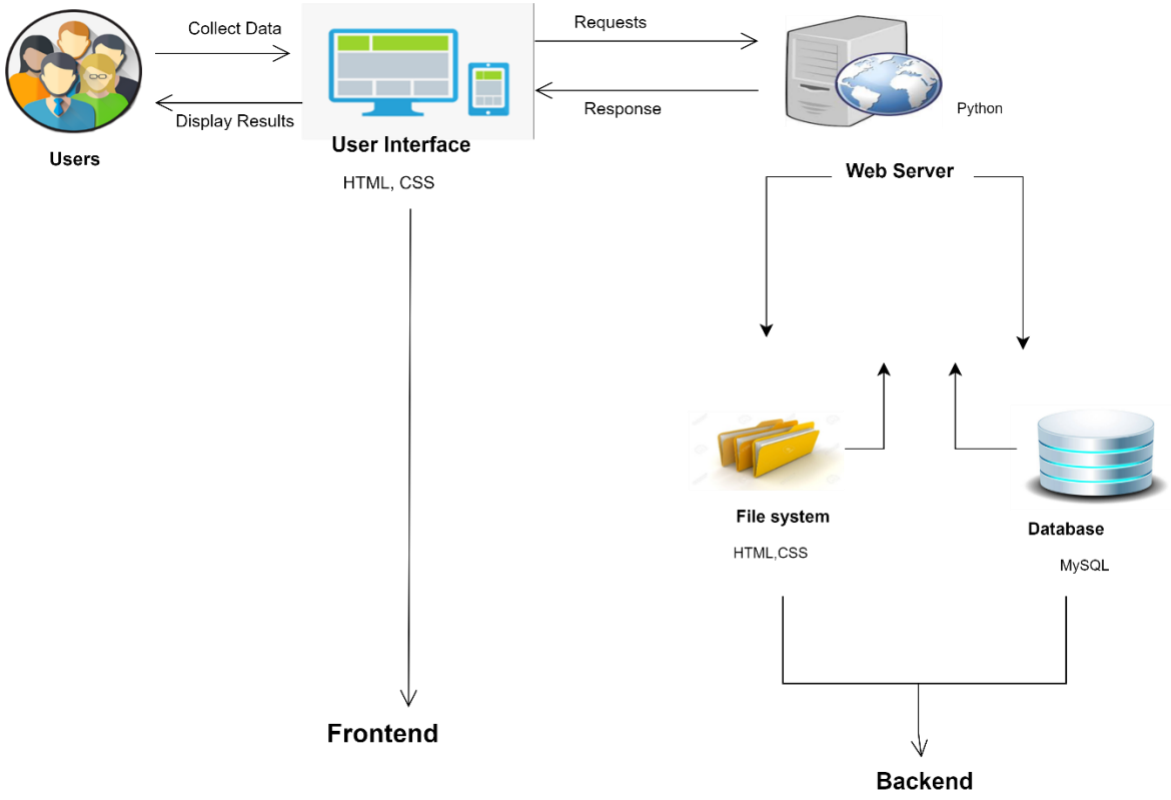
This as follow, is the web application architecture that represents a layout among all the web applications components. The web application architecture will show the users that how the components interact with each other. It will also show that how data Is delivered through HTTP, ensure that client-side server and the backed server can understand the web application as well.

THE COMPONENTS OF WEB APPLICATION

Basically, the TutorHive web application has three components, namely: Web browser, Web server and Database server.

INTERACTION AND ORGANISED OF THE WEB APPLICATIONS.

- **WEB APPLICATION ARCHITECTURE DIAGRAM**



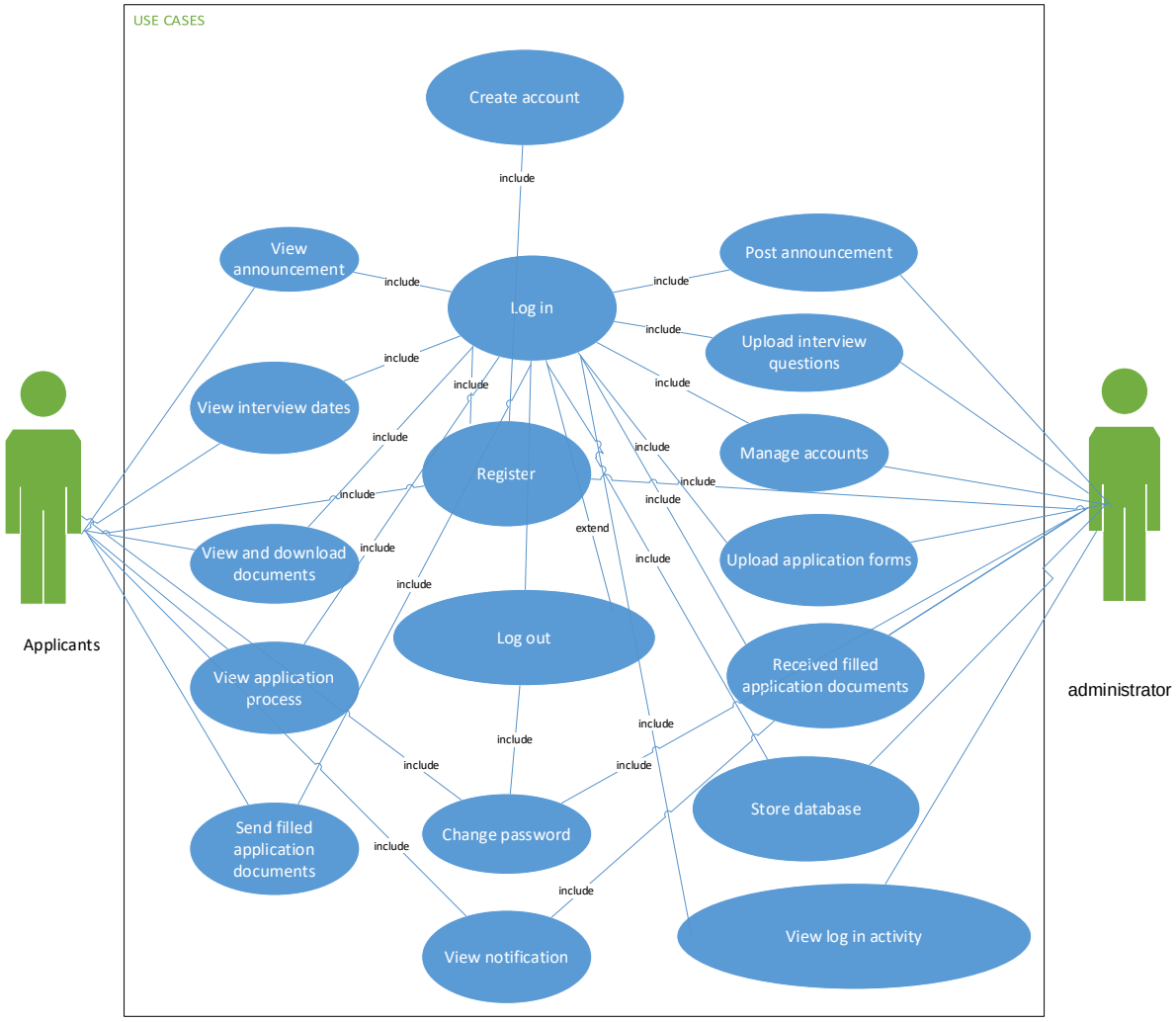
Frontend/ client side:

- The user interface components stand for all the interface elements like dashboards, notifications, settings, and more. They're a part of the web app's interface layout that is the most visible layer usually written in HTML, CSS for styling.
- Deals with designing aspects of an application.
- It all about what a user able to see for example when the applicant opens an application she will see texts button, layout or images.

Backend/ serve side:

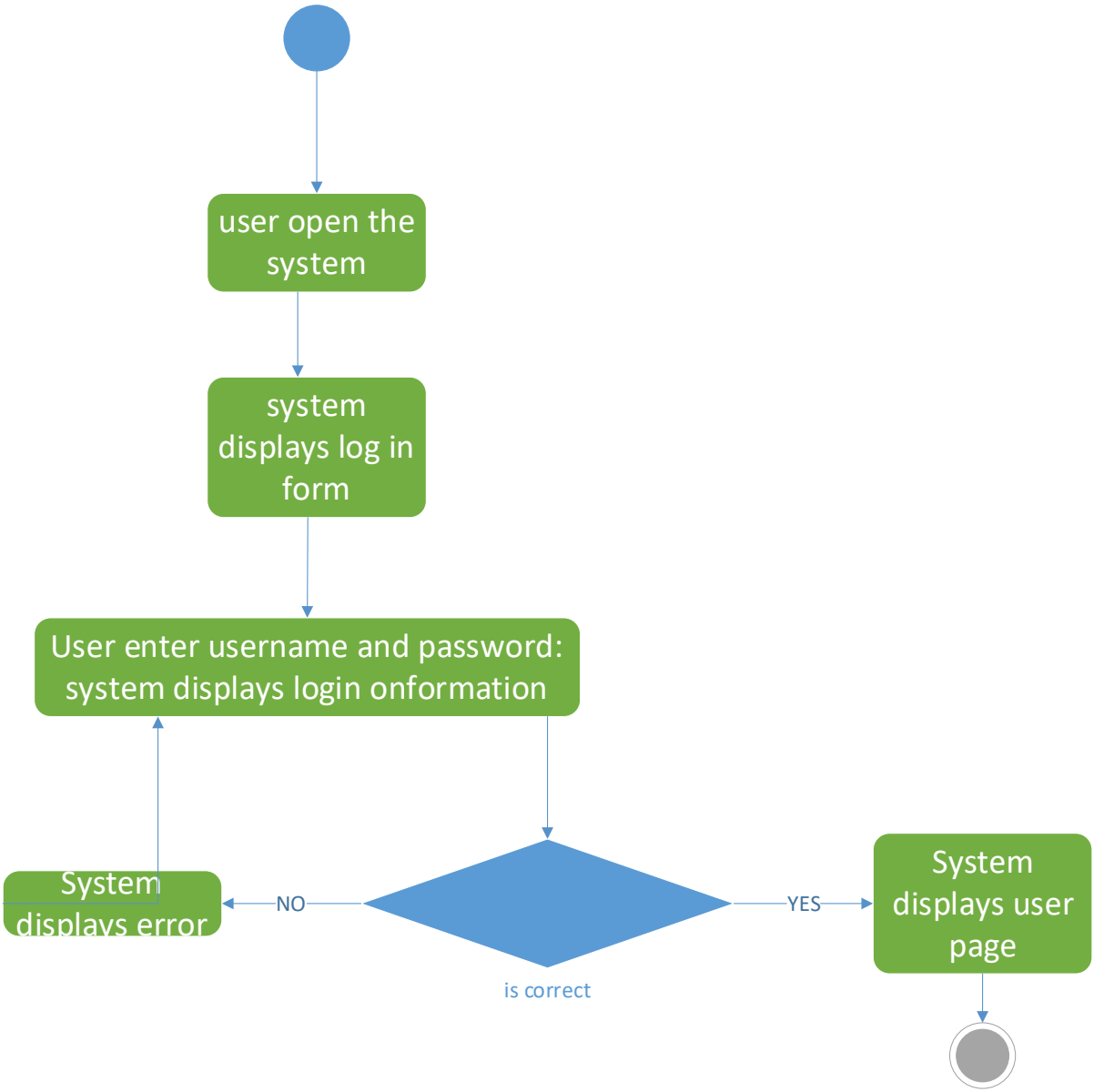
- Backend deals with data background, for example if an applicant opens a login page and enter some data and press login button then it takes data to backend page and check a user's username and password matches with registered data or not.
- Anything that is not visible to the user, for example program running on the server machine to serve the user's needs.
- Python is a type of programming used in developing TutorHive.
- Database:
  This is a database management system (DBMS) that stores and manages the data used by the web application. Database is also part of the backend. For the web application to function, they need to be able to store data in database.
- Any code that is able to respond to HTTP requests has the ability to run on a server. The server-side code is responsible for creating the page that the user requested as well as storing different types of data, including user profiles and user input.

USE CASE DIAGRAM.

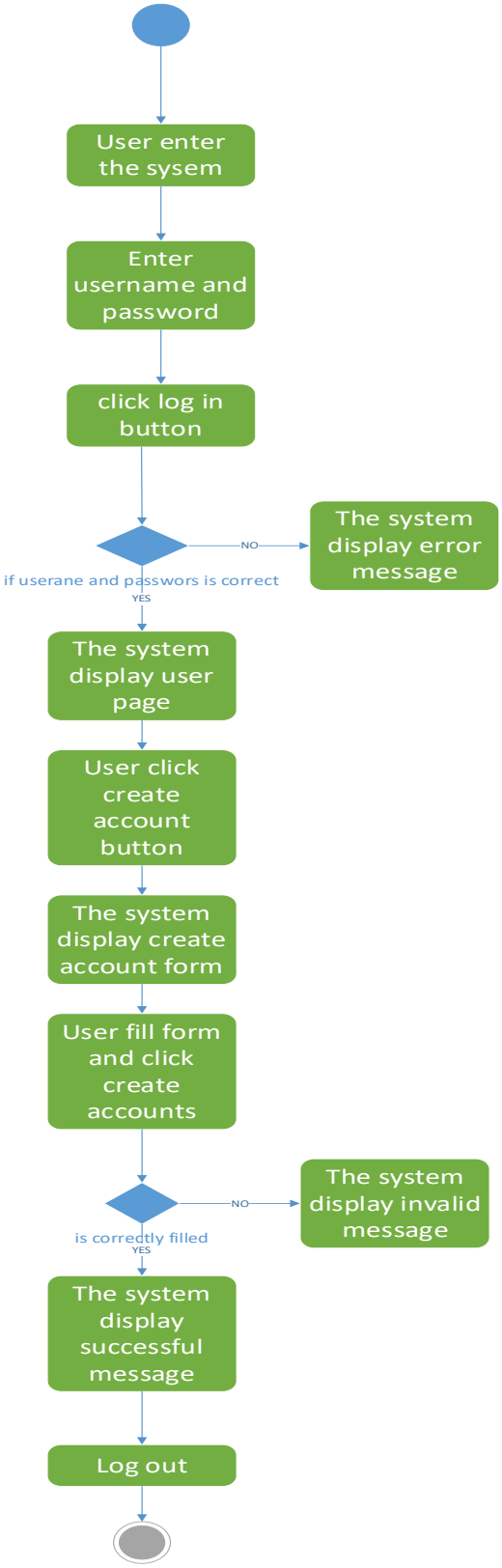


The purpose of this use case diagram is to show the users of the TutorHive web application that how they are going to use TutorHive web application. The users for this web application will applicants and administrators. There are also use cases in the diagram that describe the sequence of event for the users of the TutorHive web application.

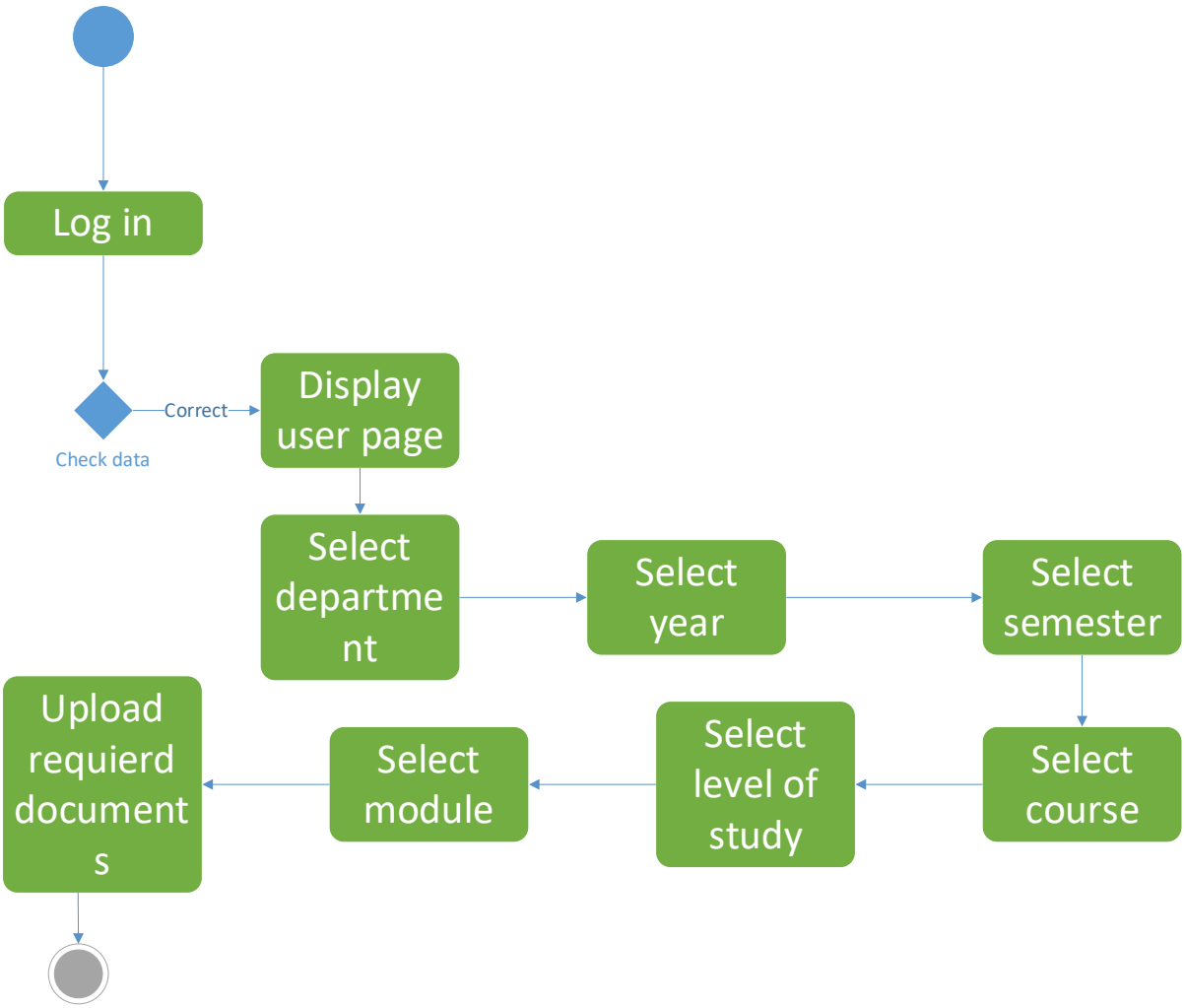
- **LOG IN ACTIVITY DIAGRAM**



- **CREATE ACCOUNT ACTIVITY DIAGRAM**



- **UPLOAD DOCUMECTS ACTIVITY DIAGRAM**



D. FUNCTIONALITY

The program consists of 6 main features which are listed below in the table. Functionality and capabilities:

Feature	Function	Capability
1. Search	Allows a user to search for a module, keywords or phrases.	Searches through the database for the module or keywords from the user and displays results
2. E-Mail	Allows a user to enter their email address.	The users email address is captured and stored into the systems database. It is used to verify the user, used for 2 – factor authentication and for communication purposes.
3. Quiz	Tests user's competency by asking questions based on personality and knowledge.	Determines whether the user qualifies to be a tutor or a student by their results gained from the quiz. A user who obtains a mark that is 80% or above qualifies to be a tutor.
4. Form	Allows the user to enter personal information.	A form page created that allows the user to enter their personal information such as their name and surname, cell phone number, student number and email address.
5. Document Submission	Allows user to upload necessary documents.	A platform upon which a user can submit their necessary documents such as ID or resume online via the web app

Use Cases

Use Case number	01
Scenario	A student wants to register
Use case name	Register Account
Brief description	A user registers their account to be able to log in.
Triggering event	A student tries to login without registering n account first.
Actor(s)	Student
Preconditions	A student before logging in must register an account on TutorHive.
Flow of activities	1. Select register. 2. Enter user details. 3. Submit registration

Use case number	02
Scenario	A form is displayed so that the user can input their details to apply for a post.
Use case name	Record details
Brief description	A student enters their personal details to apply.
Triggering event	Form already submitted. Job posts already closed.
Actor(s)	Student
Preconditions	A student could apply via the form if the job posted is from their department and if they meet the minimum requirements.
Flow of activities	1. Enter student details. 2. Upload documents 3. Submit form.

Use case number	03
Scenario	After entering details on the form, a student is required to submit supporting documents.
Use case name	Upload Document
Brief description	A student can upload pdf documents only.
Triggering event	A student attempts uploading a file larger than the required size. A student attempts uploading a file that is not a pdf file.
Actor(s)	Student
Preconditions	File must be pdf. File must be document, cannot be an image.
Flow of activities	1. Choose file. 2. Select file. 3. Upload document

Use case number	04
Scenario	A notification is sent to a student regarding their application
Use case name	Receive Notification
Brief description	Admin send notification to a student.
Triggering event	A student has applied for job post. A student has a question or needs feedback.
Actor(s)	Admin
Preconditions	Send notification if shortlisted. Send notification if responding to student.
Flow of activities	1. Type message 2. Choose candidate. 3. Send to candidate

Use case number	05
Scenario	Once then applicant has been shortlisted, they will then be tested for competency.
Use case name	Write Quiz
Brief description	A quiz is opened for the student to write.
Triggering event	Quiz not completed. Quiz with results above 80% to be considered.
Actor(s)	Admin, Student
Preconditions	Must have been shortlisted to write quiz.
Flow of activities	1. Choose candidates. 2. Upload quiz 3. Open quiz 4. Choose given options. 5. Submit quiz

User Scenario

	Attending lectures daily is an essential part of Stephanie's life. This is why she wants to tutor other students so that they excel in their studies. Stephanie uses the TutorHive application to start her application process for being a tutor, she ensures to check for feedback daily.	**Who influences Stephanie?** • Family • Work • Technology • Education • Friends **Stephanie's situation** **<u>Goals</u>** As a user I want to be able to apply for advertised job posts with ease without having to use outlook. • As Stephanie, I want to become a tutor. • As a DUT student I want to lengthen my knowledge by tutoring other students part-time. • As a user, I want to be able to look for job opportunities via the application and see if I match the required requirements through this system. • As an applicant I want to get notifications regarding my application, I want to get feedback on the applied job post.

<table>
<tr>
<td>Stephanie (Tutor/applicant)

• Age: 23 • Gender: Female
• Occupation: Still a student
• Course: Diploma ICT Application Development
• Status: unemployed
• Location: Botanical Gardens</td>
<td>Anxieties and motivations

• Stephanie is motivated by adopting to new ideas and helping others academically.
• Anxieties are when students do not attend lectures or tuts.

Needs and expectations.
• Wants a system to be easy to use, a</td>
<td>User Story (Scenario)

Stephanie is a 23-year-old student who is currently doing her final year of her 3 years Diploma at DUT. She is also a class rep in her department which makes her a responsible person. Stephanie is a hardworking woman who likes to keep herself busy, she has excellent leadership and communication skills. She ensures that she is transparent as possible and does not engage in anything that will</td>
</tr>
<tr>
<td>• Online locations: Work(school) and Mobile
• Internet usage: 7-8 hours</td>
<td>system that requires less time and effort and one that is updated regularly.
• Would love an interactive system whereby a user inputs data of their choice, also loves a system with automated features.

Questions Stephanie will ask:
• How do I keep updated on new tutoring job posts?
• How do I know which department the post is from?
• How much data will be navigating through the system cost me?
• Are my files/personal documents safe when applying for a job?</td>
<td>give her a bad name or make her lose chances of being hired as a tutor. Stephanie has a small study group and in her spare time she voluntarily tutors her classmates in modules she excels in.</td>
</tr>
</table>

E. TESTING AND DEPLOYMENT

USABILITY TESTING

Test usability was conducted for the purpose of find possible improvement in the application. Several students were recruited on campus to test it. The users were asked to perform the following tasks:

Create account.
Log in.
Submit form.
Fill in a form.
Send an email.
Attempt a quiz.

The majority understood how to use it the application because it's very usable and easy to understand, little navigation was required to reach the desired screen or webpage and it is user-friendly because controls are self- explanatory. They were able to complete the tasks independently.

COMPATIBILITY TESTING

The application is compatible with all mobile devices that belongs to android, IOS and other mobile operating systems and tablets, laptops and desktops and it can operate with various types of networks of diverse bandwidths. It was tested in different browsers to ensure that it performs well in all browsers.

PERFORMANCE TESTING

At the load of 10 users the response time was observed under the same network of diverse bandwidth and 95% of the responses were under the service level agreement of 5s but the application couldn't handle a load of 50 users, an error message was displayed.

USER INTERFACE TESTING

It is organized in a logical way that allows speedier navigation through menu. It's also easy for users to read and work with content because of the colour, font and pictures that are used.

SECURITY TESTING

The system doesn't allow invalid users, only registered users are allowed to use the app. Password are stored in an encrypted way.

DEPLOYMENT PROCESSES

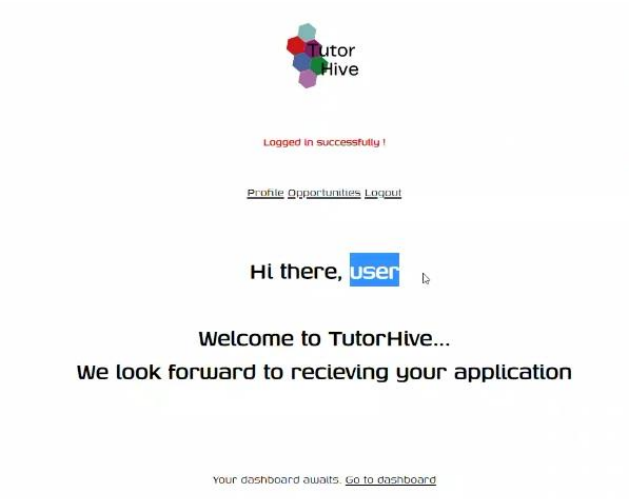
1. Identify the application we want to deploy.
2. Determine and remove redundancy.
3. Compatibility assessment of target environment
4. Planning of resources needed for the deployment.
5. Test the target environment.
6. Publish application.

SCREENSHOTS DEPICTING THE FLOW OF THE PROGRAM

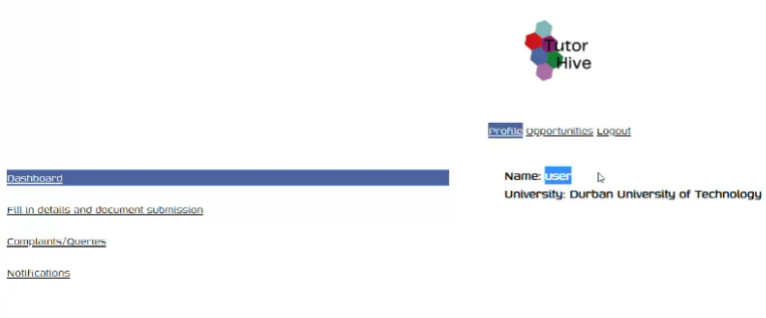
1. Sign In Page

2. Register

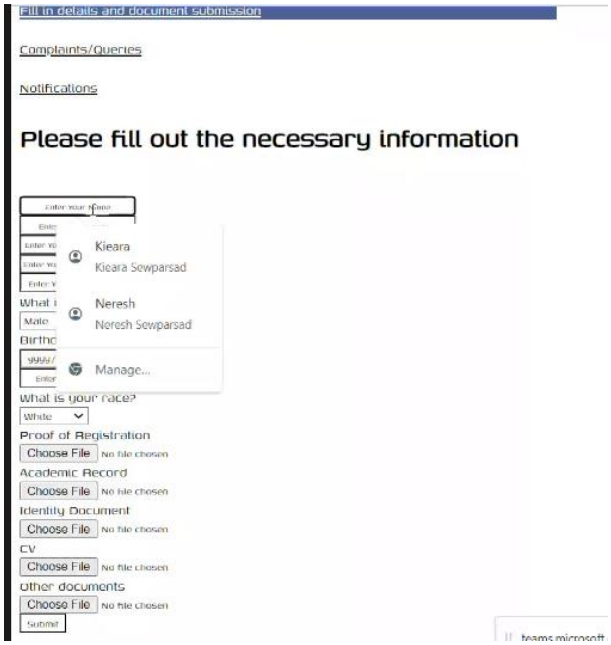
3. Welcome Page



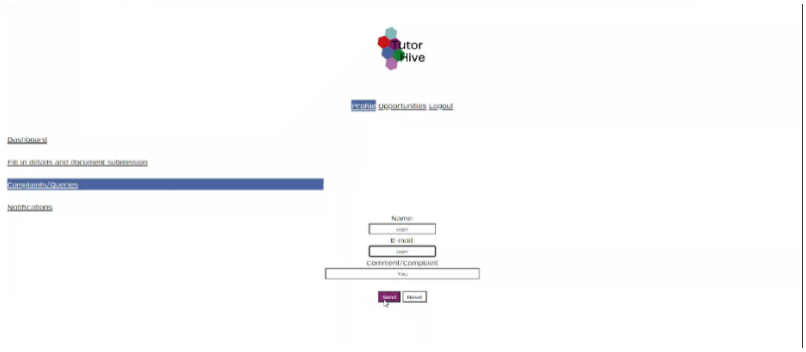
4. Dashboard



5. Document Submission



6. Complaints and queries



F. CONCLUSION

- The aim of the project was to make a complete, fully working web-based project for students (users) seeking positions in teaching assistance and tutor positions.
- The requirement or features generated by the team has been gathered and considered as they were approved by the instructor.
- According to: *Anne-Mai Aadomsoo, 2010, Web-based Project Management System*, as a good shortlisting and appointment scheduler system, it has a possibility to capture details as a form of registering interested users into the system as a form of applying for positions, upload required documents to the admin for the user (student) to be shortlisted.
- All data captured and uploads will be accessible from one place (database), to facilitate the solutions of the project.

- The system has been tested to ensure that everything conforms into its specifications, before the system processes actual data and produces functionalities the user will rely on.

Features that were implemented.

Form (user management)

- Ability to register new user (sign up)
- Ability to collect user information, required details for a position.
    - **Name, surname, qualification** etc.
- Ability to modify data and further and further on to change rights.
- Ability to lock users (user don't have possibility to log-in to the system)

Documents upload.

- user ability to upload and delete files (documents)
- admin ability to access or download files.

Email

- ability to capture user email address.
- admin ability to generate feedback to the users.
- user ability to seek assistance or query from the admin.

Notification

- ability of both user and admin to communicate.
- user can be notified by the admin through the application.
    - **E.g., files are missing.**
    - **New information that's needs to be addressed**

Search bar

- User ability to search using key words or phrases to easily find information.
- Ability to present results in real time.
- Quick and smooth user experience.

User interface design

- Ability allows the user and application to interact.
- Find information easy.

To conclude, the shortlisting and scheduling system is completed as one fully functioning system that corresponds to the university and faculties needs and helps with inconvenience to the students and the faculties, they seek teaching assistance and tutoring in.

The results of the project responded to the user expectation based on the tests done in the application. The team was satisfied with the features implemented and their robustness.

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